

REMARKS

The Examiner has noted that the cited references must be submitted in an Information Disclosure Statement. Applicants will provide copies of the cited references and submit them forthwith. The Examiner has additionally objected to the disclosure based on the use of the term "optimization by annealing" or "simulated annealing" which is incorporated by reference to several of the cited references. Applicants respectfully submit that the term is well understood by one having skill in the relevant art; but, will, nonetheless, provide copies of the references to which Applicants referred. The drawings have been objected to as informal. Applicants will prepare and submit formal drawings in the course of prosecution.

Claims 15, 16, 19, and 20 have been rejected under 35 USC 112 as being indefinite. The Examiner has specifically objected to the use of the terms "high crosstalk subchannels" and "the or each high crosstalk subchannel". Applicants first note that the latter term is "the or each high crosstalk subchannel signal" which is clearly not a narrower statement of "high crosstalk subchannels" since one claim recitation is to the subchannels while the other is to the signal on the subchannels. Applicants recognize,

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nonetheless, that the language was awkward, since "high crosstalk subchannel" did not have an antecedent basis. Accordingly, Applicants have amended the language of Claims 15-19 and 22. Applicants believe that the claim language, as amended, is definite and patentable and respectfully request withdrawal of the 112 rejections of the claims.

The Examiner has rejected Claims 1-14 and 21 under 35 USC 103 as unpatentable over Garrison in view of Eto; has rejected Claims 15, 17 and 22 under 35 USC 103 as unpatentable over Miseki; has rejected Claims 16 and 18 under 35 USC 103 as unpatentable over Miseki in view of Raman; and, has indicated that Claims 19 and 20 are allowable and would be allowed if rewritten to overcome the 112 rejections (addressed above). For the reasons set forth below, Applicants believe that all of the pending claims are allowable over the cited art.

The present invention provides apparatus and a method for compensating for far end crosstalk (FEXT) in a multichannel communications network. For each subchannel of a channel at the receiving node/end, a gain factor is determined, based on signal to noise ratio of the channel and a target transmission rate. Once the gain factor is calculated, it is communicated to the transmitting node and

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subsequent transmissions are multiplied by the gain factor and then modulated onto the carrier signal for transmission.

The Examiner has cited the Garrison patent as a primary reference against the claims. The Garrison patent teaches a satellite communications system wherein the signal to noise ratio is determined at a user terminal and, based on the signal to noise ratio, the power level at which the satellite transmits signals to the user terminal is determined and a power setting command is communicated to the satellite. Garrison expressly states at Col. 12, lines 29-31 that "[t]he new power setting command identifies the power level at which the transmitter 8 must emit RF signals along the return link."

Applicants respectfully assert that the Garrison patent does not, alone or in combination with Eto, obviate the invention as claimed. It is first to be noted, as recited in the rejected Claims 1-14 and 21, that the Garrison patent is not directed to communicating information via subchannels of a communications channel. Rather, Garrison is sending RF signals to whatever antenna is tuned to receive the signals. Further, the present application teaches and claims the step, at the receiving end of the communications channel, of determining a gain factor for the one or more subchannels, in dependence on the signal to noise ratio of the channel

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and a target transmission rate for the information signal. The gain factor is to be applied to the subchannel signal for the particular subchannel at the transmitting node to effect transmission of the information signal to the receiving node with minimum transmission power, by multiplying the signal by the gain factor. In contrast, the Garrison patent teaches calculation of a power level strictly based on signal to noise ratio at a single user terminal, not multiple subchannels at the user terminal. Garrison does not determine a gain factor for each of a plurality of subchannels; does not base its power level determination on a target transmission rate; and does not look to effect transmission with minimum transmission power. In fact, Garrison expressly teaches increasing transmission power to the calculated power level in order to overcome noise at the user terminal.

Applicants further contend that Garrison does not teach a step of communicating a determined gain factor for the, or each, subchannel signal from the receiving node to the transmitting node. Garrison teaches sending a "new power setting command [which] identifies the power level at which the transmitter 8 must emit RF signals" (Col. 12, lines 29-31). With regard to the claim steps of applying the gain factor to the corresponding subchannel signal at the

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transmitting node and transmitting the information signal to the receiving node, Applicants reiterate that Garrison does not determine a gain factor for each subchannel of a communications channel; does not determine a gain factor, or even the power level, based on target transmission rate; does not communicate a gain factor for each subchannel to a transmitting node; and does not modulate a signal with a gain factor. Garrison simply transmits at a calculated power level.

Applicants disagree with the Examiner's interpretation of the Garrison patent teachings. In paragraph 10 of the Office Action, the Examiner concludes that "[w]hat Garrison teaches is SNR changes the gain". In fact, though, Garrison is teaching that the signal to noise ratio (SNR) is used to generate an overall power setting, not a gain factor. The Examiner acknowledges that "[W]hat Garrison does not teach is that the transmission rate changes the gain." The Examiner then goes on to cite the Eto patent for teachings "...that the transmission rate changes the C/N...which changes the SNR." Applicants respectfully assert that the Eto teachings of changing the C/N do not obviate the claimed use of a target transmission rate in determining a gain factor for subchannel signal transmissions. Even if the C/N would change the SNR, such a modification of Garrison would

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simply result in a different SNR at the user terminal, which Garrison would then use to calculate a power level. It would not, however, result in a determination of a gain factor for multiplying signals to be transmitted along a subchannel based on both SNR at the subchannel and a target transmission rate for the subchannel.

Applicants respectfully assert that the Examiner has not presented a *prima facie* case of obviousness against the claim language. Under U. S. Patent Law, a *prima facie* case of obviousness can only be established if the prior art teaches or suggests all of the claim limitations (*In re Wilson*, 424 F. 2d 1382, 1385, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970)). Since neither Garrison nor Eto teaches or suggests determining a gain factor for each of a plurality of subchannels; determining the gain factor based on signal to noise ratio and target transmission rate for the subchannel; effecting transmission with minimum transmission power; communicating a gain factor to the transmitting node; applying the gain factor by multiplying the information signal by the gain factor; and modulating the subchannel signal with the multiplied information signal, it cannot be concluded that the Examiner has established a *prima facie* case of obviousness against the claim language.

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The Examiner has further rejected Claims 15, 17 and 22 as obvious in view of Miseki and Claims 16 and 18 as obvious in view of the combined teachings of Miseki and Raman. The rejected claims recite a method, receiver, and program storage device for implementing a method for compensating for cross talk in a multichannel communications link comprising a plurality of channels each having at least one sub channel, between a transmitting node and a receiving node of a data communications network, the method comprising, in a receiving node, for each subchannel of each channel, the steps of partitioning the subchannels of the other channels into at least one high crosstalk subchannel and at least one low crosstalk subchannel; and, decoding the subchannel signal in dependence on the signal on the at least one high crosstalk subchannel. The Miseki patent teaches that a single input signal is separated by the demodulator, as shown in the referenced Fig. 20. The demodulator then, based on bit allocation, sends the signal component which it determines to be the speech component to the speech decoder and sends the signal component which it determines to be the noise component to the noise decoder. After each decoder has performed its operations on the signal components, the outputs of the decoders are "reunited" at the mixer to produce the output. Miseki does

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not teach, that subchannels of channels are partitioned into high and low crosstalk subchannels. Rather, Miseki teaches that a single input signal is demodulated into components for decoding. The Examiner further concludes that "[w]hat Meseki (*sic*) teaches is that the noise has multiple channels or frequencies or subchannels...but does not teach that the speech has multiple channels or frequencies or subchannels." The Examiner then goes on to state that "[t]he office takes official notice that speech is composed of a range of frequencies and hence has multiple channels or subchannels.

Applicants respectfully assert that the Examiner is confusing two distinct concepts, that of signals having multiple signal components (e.g., multiple frequencies) and that of a communications transmission medium (i.e., a channel) having multiple subchannel components. What is being claimed are means and a method for signal processing based on identified characteristics of communications media, specifically the crosstalk characteristics of the subchannels. Applicants respectfully assert that demultiplexing a single signal into signal components and then separately processing the signal components (e.g., the different speech frequencies) based on the signal characteristics is not the same as or suggestive of selectively processing an input signal based on the

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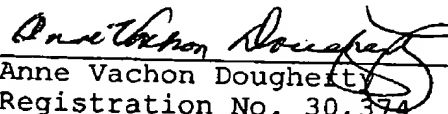
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subchannel characteristics. Applicants further assert that the additionally-cited Raman patent teachings regarding separating speech from noise using a threshold do not, alone or in combination with Miseki, provide teachings which obviate the claim language. Neither Miseki nor Raman teaches or suggests means and a method for signal processing based on identified characteristics of communications media, specifically the crosstalk characteristics of partitioned subchannels. Accordingly, Applicants again conclude that a *prima facie* case of obviousness has not been established.

Based on the foregoing amendments and remarks, Applicants respectfully request entry of the amendments, reconsideration of the amended claim language in light of the remarks, withdrawal of the rejections, and allowance of the claims.

Respectfully submitted,

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